



New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

ULTRA-LOW TEMPERATURE FREEZERS

*Now The Legendary Durability Of The New Brunswick
Shaker Is Available For Your Storage Needs Too!*





New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

NBS -86°C Freezers

*Entrust the Storage of Your Cultures to the
Company You Trust Most for Their Growth*

New Brunswick Scientific's lab equipment is legendary for design innovation, quality construction and long-term durability. Our -86°C freezers are no exception. Already a leading freezer supplier in Europe, our ultra-low temperature freezers have a 20-year track record of proven performance and are now available worldwide.

Nine models in two ranges accommodate a variety of needs:

Innova models — utilize Vacuum Insulation Panel (VIP) technology to provide up to 30% more storage capacity, without increasing external dimensions.

Premium models — are high-quality, full-featured, yet provide a cost saving alternative by utilizing conventional polyurethane insulation.



More storage — same space. That's the advantage of our Innova freezers, available in chest or upright styles. It's room you won't have to make room for.



We fit 10,400 more samples in this freezer without increasing its size. Magic? No...VIP technology. Details, pages 4 and 5.

NBS INNOVA & PREMIUM FREEZERS OFFER THE ULTIMATE IN SAMPLE STORAGE

ENERGY EFFICIENT

Tollesbury Technology

reduces time compressor remains on by 40-50%. Provides quick temperature recovery after door opening, optimizes heat removal, lowers energy bills & extends compressor life. (Innova Models only)

- 1 **Outer Door Seals**
flexible, low-temperature seals prevent cold air loss for lower energy bills and less maintenance
- 2 **Quiet Powerful Fan**
reduces noise and maintenance
- 3 **Multiple Compartments**
with insulated inner doors & lids protect samples and improve energy efficiency

SAMPLE SECURITY

- 4 **Keyed Locks on Outer Doors & Lids**
prevent unauthorized access
- 5 **User-Defined 4-Digit Password**
prevents unauthorized changes to alarm and temperature setpoints
- 5 **Audible and Visual Alarms**
indicate high & low temperature conditions, power failure, low battery, blocked filter & fault condition
- 6 **Lockable Plate**
over power & alarm switches prevent accidental shutdown

Automatic Restart with Non-Volatile Memory

returns setpoints to user-programmed levels after power interrupt

Battery Backup

maintains temperature settings and activates alarms during power outage

Optional CO₂ & LN₂ Backup Systems

protect freezer contents

Remote Contacts

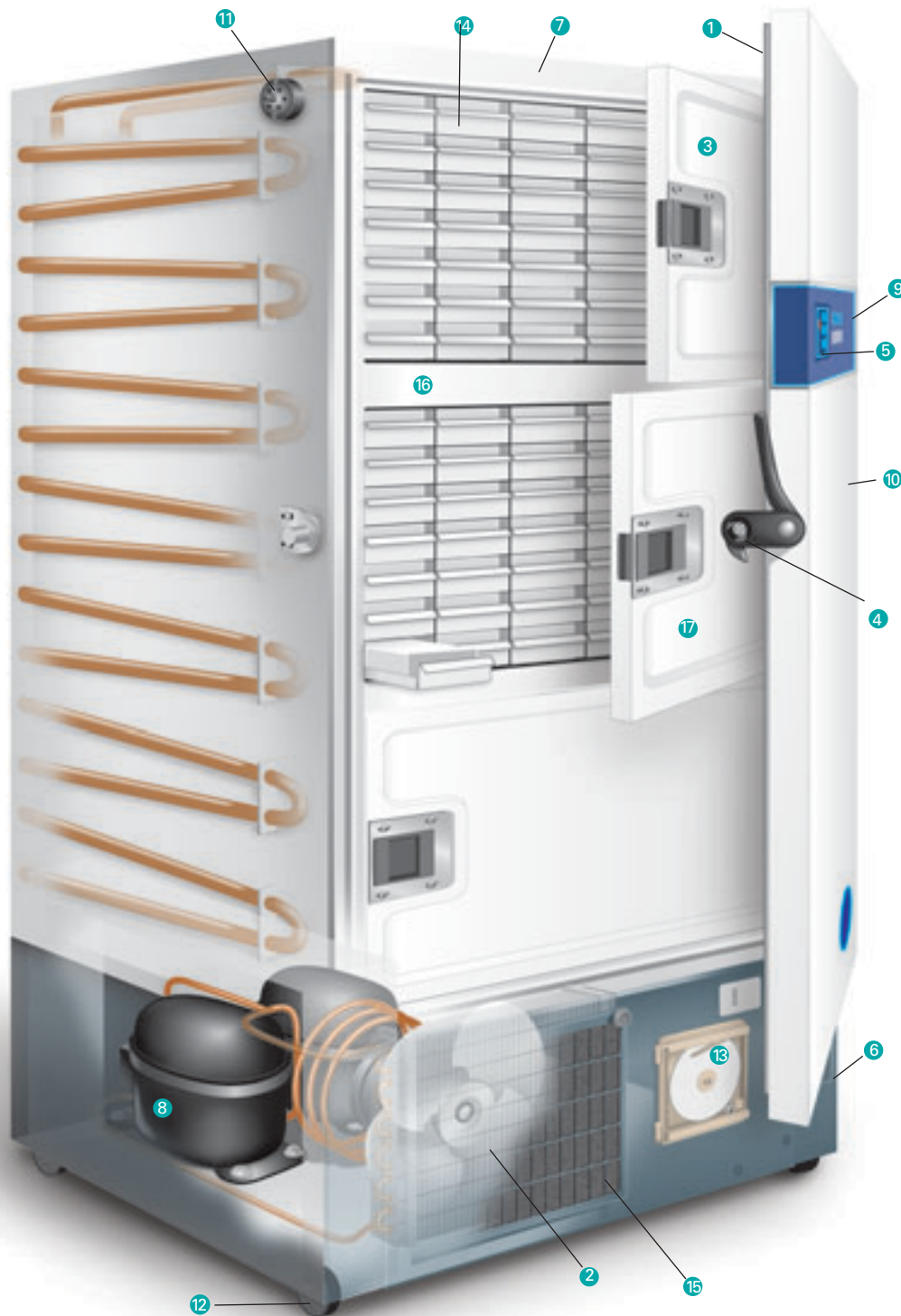
provide connection to an external, user-supplied, security system

OTHER DESIGN ADVANTAGES

- 7 **Innova Models**
increase storage by up to 30% over freezers of equal size
- 8 **Two-Stage Cascade Refrigeration**
system uses industrial-grade, commercially-available, hermetically-sealed compressors
- Top-Quality Stainless-Steel Interior**
prevents oxidation, scratches or rust; easily cleaned
- Unique Automatic Reset**
protects the microprocessor controller from damage by electrical spikes

Internal Voltage Stabilizer
evens out voltage fluctuations, maintaining stable power (60 Hz Innova models only excluding U101). External option on Premium and U101 models

Two Pass-Through Ports
allow CO₂/LN₂ injection or addition of probes



EASY-TO-USE MEMBRANE KEYPAD, CONTROLS & ALARM SYSTEM

FRONT-MOUNTED MICROPROCESSOR CONTROL PANEL

- Ergonomically located
- Easy to read and operate
- Membrane keypad is easily cleaned

CONVENIENCE

Front-Mounted Control Panel
easy to read and reach

Easy-to-Open Door
provides one-handed operation; cam latch ensures secure door closure

Heated Vent
prevents vacuum formation, allowing door to be reopened quickly

Low Noise & Low Heat Output
allow freezer to be placed directly in the lab

Easy Mobility
all models fit through standard doors and elevators and include heavy-duty casters. (Compact U101 provided with rear rollers)

Remote Control & Data Logging
optional CryoCommand™ software with RS-485 interface controls up to 30 freezers

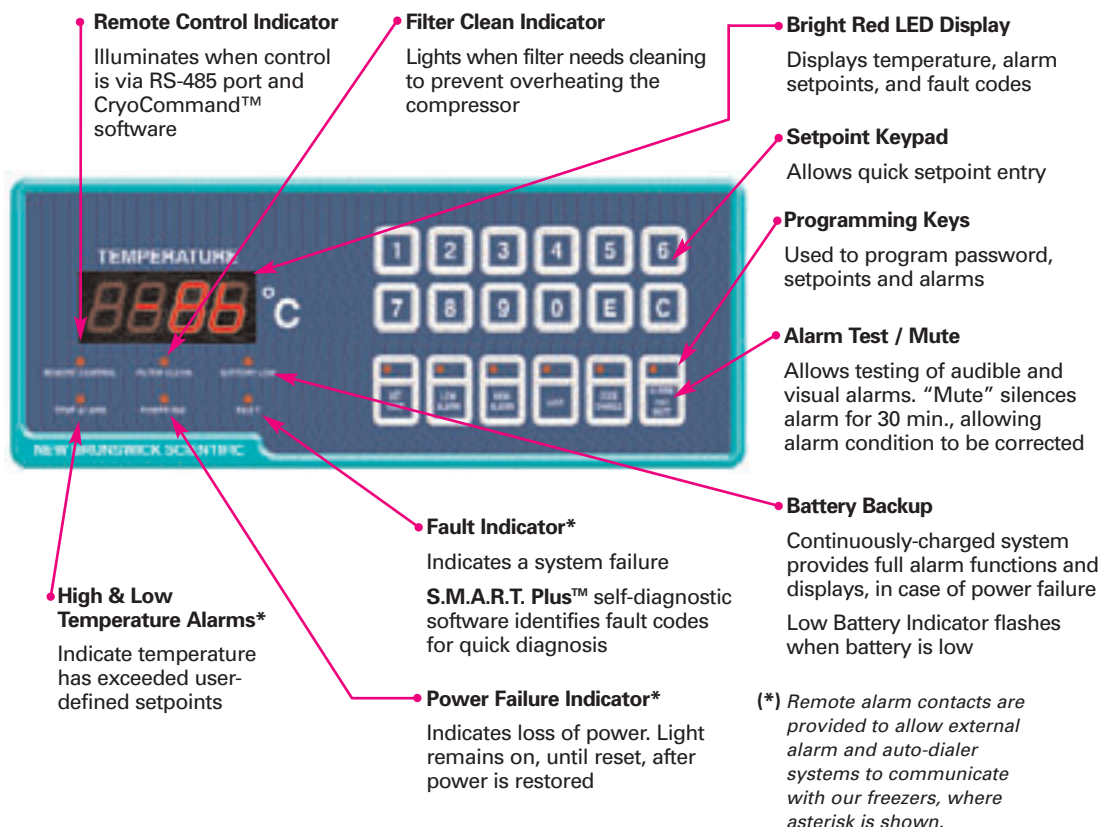
Optional Data Loggers
from chart recorders to paperless systems simplify validation

Optional Inventory Racking
available to optimize your storage space

Front-Mounted, Washable Filter
easily accessed without tools

Stainless-Steel Shelves
provided in all uprights. Adjustable height, high quality

Easily-Removed Inner Doors
lift off hinges without tools for defrosting & cleaning. (Door hinges in Premium models unscrew)



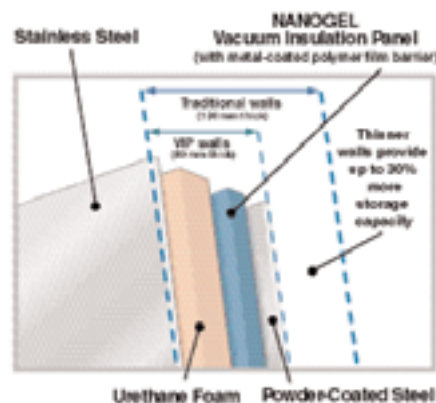
WHAT IS VACUUM INSULATION AND WHY IS IT ADVANTAGEOUS?

Vacuum insulation is an advanced thermal insulation technology that significantly outperforms insulating materials such as closed-cell foams (urethane), foam beads or fiber blankets. These conventional technologies attempt to trap gasses to reduce heat transfer. Vacuum insulation removes the gasses within the insulating space, so the material is placed under a "vacuum." With air molecules removed, heat transfer is greatly reduced. The result is:

- Thermal insulation performance that far exceeds traditional insulating materials
- Ultra-thin walls for up to 30% more room to store samples

There are other freezers that use Innova Vacuum Insulation Panel technology, but none use NANOGEL™. NANOGEL panels provide:

- The best thermal insulation of any traditional or VIP material on the market
- An environmentally friendly design, using biodegradable, CFC-free and HCFC-free materials
- A metal-coated polymer film barrier seal to maintain its vacuum. Competitive models are subject to accumulation of gasses over time, resulting in a loss of vacuum level and therefore reduced thermal performance. Even under complete vacuum barrier failure, NANOGEL's performance is two times better than foams.



INNOVA FREEZERS WITH VACUUM

UP TO 30% MORE STORAGE CAPACITY — SAME FOOTPRINT

NBS' Innova freezers combine Vacuum Insulation Panel technology with our efficient cooling technology to provide the ultimate in space and power efficiency. These models offer up to 30% more storage capacity than traditionally insulated freezers, without increasing external dimensions. Plus, they come standard with NBS' unique Tollesbury Technology to provide more rapid temperature recovery after door opening for better preserved samples and reduced power consumption.

INNOVA FREEZER ADVANTAGES

- **Greater Internal Storage Capacity** in the same footprint through use of Vacuum Insulation Panel technology
- **Faster Temperature Recovery** after door opening through patented Tollesbury Technology. Improves sample preservation, lowers energy consumption and lengthens compressor life
- **Inner Door Seals That Prevent Cold Air Loss** and eliminate need for a door heater, for lower energy bills and less maintenance
- **And Higher-Grade Seals** for outer door and cabinet; better-quality internal lids on chest models; and inner doors on uprights that lift off hinges without tools



Keep your samples safe, secure and accessible only by you with Model U101 — a unique, personal-sized upright freezer that fits on or under your lab bench.

CAPACITY & DIMENSIONS

Model No. Style	Catalog #	Electrical	Capacity		Max. Box Capacity			Dimensions (H x W x D)†		Shipping Wt.
			L	Cubic Ft.	2"	3"	4"	External	Internal	
U101 Upright	U9420-0000	120 V, 60 Hz	101	3.6	60	36	24	32.7" x 35.4" x 22.3"	25.2" x 18.9" x 13"	256 lbs 116 kg
	U9420-0001	230 V, 50 Hz*						83 x 90 x 56.6 cm	64 x 48 x 33 cm	
U535 Upright	U9430-0000	120 V, 60 Hz	535	18.9	336	240	144	76.8" x 31.5" x 34.1"	53.7" x 25.2" x 24.2"	551 lbs 250 kg
	U9430-0002 U9430-0001	208/220 V, 60 Hz 230 V, 50 Hz*						195 x 80 x 86.7 cm	136.5 x 64 x 61.5 cm	
U725 Upright	U9440-0002	208/220 V, 60 Hz	725	25.6	504	360	216	76.8" x 40.4" x 34.1"	53.7" x 34.1" x 24.2"	694 lbs 315 kg
	U9440-0001	230 V, 50 Hz*						195 x 102.5 x 86.7 cm	136.5 x 86.5 x 61.5 cm	
C585 Chest	U9400-0000	120 V, 60 Hz	585	20.7	416	288	192	43" x 66.5" x 30.9"	30.7" x 47.2" x 24.6"	529 lbs 240 kg
	U9400-0002 U9400-0001	208/220 V, 60 Hz 230 V, 50 Hz*						109.2 x 169 x 78.5 cm	78 x 120 x 62.5 cm	
C760 Chest	U9410-0002	208/220 V, 60 Hz	760	26.9	572	396	264	43" x 80.7" x 30.9"	30.7" x 61.4" x 24.6"	628 lbs 285 kg
	U9410-0001	230 V, 50 Hz*						109.2 x 205 x 78.5 cm	78 x 156 x 62.5 cm	

(†) To allow for handles and hinges, add 3.1" (8 cm) to width of upright freezers and 4.3" (11 cm) to the depth of chest freezers.

(*) All 50 Hz freezers are supplied with both U.K. and Schuko cordsets.



As shown above, not to scale.

INSULATION PANELS

Upright Models U101, U535, U725,
and Chest Styles C585, C760

INNOVA FREEZER SPECIFICATIONS*

CONSTRUCTION

Insulation: VIP: Ultra-thin Vacuum Insulation Panels with NANO GEL™, encapsulated between a metallic polymer film barrier, bonded to foamed-in-place polyurethane foam; 3.15", 80 mm thick

Exterior: 18 gauge steel, 1.2 mm thick. Powder coated, scratch and rust resistant

Interior: Top-quality, polished 304L stainless steel

Heated Air Vent: with plunger prevents vacuum formation

Air Filter: Front-mounted; Easily accessed by 1/4 turn screws

Access Ports: Two pass-through ports, 3/4", 20 mm dia.

Casters & Feet: Heavy-duty lockable casters with adjustable leveling feet. Two rear rollers provided on Model U101

TEMPERATURE CONTROL SYSTEM

Range: Programmable, to -86°C, in 1°C increments, even at ambient temperature up to 32°C

Control: Microprocessor-controlled temperature and alarms with non-volatile memory

Display: Large, bright, digital LED characters, 1/2", 1.3 cm high. Mounted for ergonomic viewing

Optional Remote Control: Factory-installed RS-485 port with optional CryoCommand™ software monitors/controls up to 30 freezers simultaneously

Battery Back-up: Activates alarms and displays temperature during power outages. Separate on-off switch provided for cleaning/servicing/thawing

REFRIGERATION

Cascade Refrigeration: Hermetically-sealed two-stage cascade system with capacity to cope in high-ambient conditions

Compressors: Low-noise, heavy-duty & commercially-available

Tollesbury Technology: Patented system reduces temperature recovery time after door opening, minimizing power consumption and optimizing compressor efficiency[◇]

Circulation: Requires just one fan for reduced power consumption and noise

Refrigerants: CFC-free and HCFC-free

Compressor Lubricants: Biodegradable and commercially-available, high-performance, synthetic polyolester oil. Prevents "oil-logging"

SECURITY FEATURES

Unique 4-Digit Password: For temperature setpoint and alarms, prevents unauthorized changes

Lock and Key: for outer doors/lids. Barrel lock is removable

Lockable Security Plate: protects on-off switch and alarm on/off

MONITORING & ALARMS

S.M.A.R.T. Plus™ Diagnostic Software: Built into the control panel, provides fault codes to trace and solve system errors

Remote Alarm Contacts: Provide connection to external user-supplied alarm/monitoring system

Visual Alarms: High/low temperature, power out, system fail, battery low, filter clean and fault analysis. LED lamp for remote control operation

Audible Alarms: High/low temperature, power out and system fail

UPRIGHT MODEL FEATURES

Door Latch: Injection-molded fiber-reinforced handle with built-in removable lock. Powerful cam-action/reverse cam-action latch provides one-handed operation; pulls door firmly closed and pushes door open. Clicks to indicate proper closure

Compartments and Shelving: Three compartments with two adjustable-height, stainless-steel shelves. (Model U101: Two compartments, one fixed shelf.) Additional shelving available

Insulated Inner Doors: Latchable doors lift off stainless-steel hinges, without tools. Two on U101; three on U535 & U725

Cabinet & Door Seals: Cabinet and outer doors fitted with high-efficiency silicone seals. High-quality seals for inner doors also provided

FEATURES UNIQUE TO CHEST MODELS

Door Latch: Positive, single-handed cam action latch with lock

Insulated Sub-Lids: Two injection-molded lids on C585; three on C760

CERTIFICATIONS

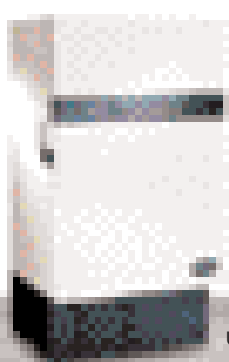
CE Certified and UL Certified

(*) Specifications subject to change without notice

(◇) U.S. patent No. 6,449,980. U.K. patent No. GB2370874.



Upright: Model U535



Upright: Model U725



Chest: Model C760

POWER CONSUMPTION, FEATURES & PLUGS

POWER FEATURES & ADVANTAGES











Internal Voltage Stabilizer (60 Hz Innova Models excluding U101): Evens out high and low voltage fluctuations and optimizes energy usage. Optional external unit available for Premiums and U101

Automatic Reset: Protects the microprocessor controller from failure caused by power spikes

Automatic Restart with Non-Volatile Memory: Returns alarms and setpoints to user-programmed levels after power interrupt

Programmed Restart: Random startup, 1 - 1.5 minutes apart. Prevents power overload

PLUG CONFIGURATIONS

Freezers with this Code	Have this Plug	Require this Receptacle	NEMA Reference	
			Plug	Receptacle
A			5-15P	5-15
B			5-20P	5-20
C			6-15P	6-15
I N T E R N A T I O N A L				
D			European (Schuko)	
E			UK Model	

POWER CONSUMPTION*

Brand	Model	Voltage	Amps	Plug Provided	Power Consump.		Pull-Down Time /Hrs.
					Watts	kWh/day	
Innova	U101	120 V, 60 Hz 230 V, 50 Hz	10 5	A D/E	530	12.72	3.7
	U535	120 V, 60 Hz ◊ 208/220 V, 60 Hz 230 V, 50 Hz	13 7 7	B C D/E	550	13.20	4.5
	U725	208/220 V, 60 Hz 230 V, 50 Hz	10 10	C D/E	660	15.84	4.9
	C585	120 V, 60 Hz ◊ 208/220 V, 60 Hz 230 V, 50 Hz	13 7 7	B C D/E	565	13.56	3.5
	C760	208/220 V, 60 Hz 230 V, 50 Hz	10 10	C D/E	665	15.96	5.5
Premium	U410	120 V, 60 Hz ◊ 208/220 V, 60 Hz 230 V, 50 Hz	15 7 7	B C D/E	525	12.60	3.75
	U570	120 V, 60 Hz ◊ 208/220 V, 60 Hz 230 V, 50 Hz	12 7 7	B C D/E	565	13.56	4.5
	C340	120 V, 60 Hz ◊ 230 V, 50 Hz	15 7	B D/E	420	10.1	4.6
	C660	208/220 V, 60 Hz 230 V, 50 Hz	7 7	C D/E	595	14.28	4.0

(*) All models use single phase power. Amperage shown designates "running" amps.

(◊) 120 V freezers with this designation require a dedicated 20 Amp line to cover the amps drawn at start-up.

Power Consumption Data & Pull-Down Times are based on an empty freezer set to -80°C, ambient temperature 23°C, using a 240 V, 50 Hz power supply.

INVENTORY RACKING CAPACITIES

Model	Style	Brand	Cu. Ft.	Compartments per Freezer	Racks per Shelf	Racks per Freezer	Box Size*	Boxes per Rack	Boxes per Freezer	Vials per Freezer**
U101	Upright	Innova	3.6	2	3	6	2" 3"	10 6	60 36	6,000 3,600
U535	Upright	Innova	18.9	3	4	12	2" 3"	28 20	336 240	33,600 24,000
U725	Upright	Innova	25.6	3	6	18	2" 3"	28 20	504 360	50,400 36,000
C585	Chest	Innova	20.7	NA	NA	32†	2" 3"	13 9	416 288	41,600 28,800
C760	Chest	Innova	26.9	NA	NA	44†	2" 3"	13 9	572 396	57,200 39,600
U410	Upright	Premium	14.5	5	3	15	2" 3"	16 12	240 180	24,000 18,000
U570	Upright	Premium	20.0	5	5	25	2" 3"	16 12	400 300	40,000 30,000
C340	Chest	Premium	12.0	NA	NA	20†	2" 3"	13 9	260 180	26,000 18,000
C660	Chest	Premium	23.3	NA	NA	40†	2" 3"	13 9	520 360	52,000 36,000

(*) 4" Boxes also available. Ask your rep for details

(**) Based on a box capacity of 100 vials

(†) Half-height racking available

FREEZER ACCESSORIES Everything you need to preserve the integrity of your samples.



CO₂/LN₂ controller features selectable setpoint dial. LED lights to indicate when system is activated or valve open

CO₂ & LN₂ CONTROLLER BACK-UP SYSTEM

Safely protect your samples

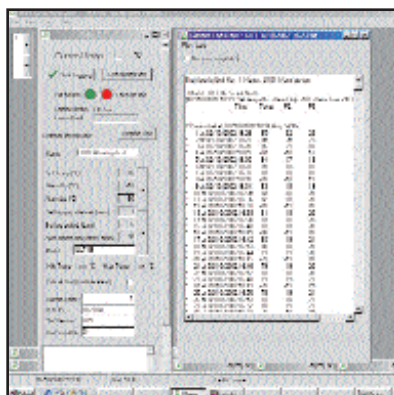
- Maintain temperature between -55°C and -70°C with Liquid CO₂, or down to -85°C with LN₂, subject to environmental conditions
- Coolant addition is pulsed to avoid excessive consumption
- Built-in safety device prevents pulsing while the door is open

DATA LOGGING and CONTROL

CryoCommand™ Software

Remotely log and control temperature and alarms in up to 30 NBS freezers from a single PC

- Easy-to-use screens let you individually change high and low temperature alarms and setpoints
- Alarm conditions are recorded and signalled by a flashing screen
- Package includes software and factory-installed RS-485 interface



NBS' CryoCommand software

Chart Recorder/Data Loggers

Continuously monitor and record temperature for up to 7 days

- Temperature range of +20°C to -90°C, $\pm 2\%$
- Front-mounted for easy access. Factory installation recommended
- Contact your sales representative for other options



7-day chart recorder

AUTO-DIALERS

Auto-dialers can call a set of preprogrammed telephone numbers in the event of an alarm condition and connect right into the freezer's remote alarm port

TEMPERATURE PROBES

Additional temperature probe for an external alarm system or for validation can be installed upon request

VALIDATION PACKAGES

Installation and operational qualifications are available. Ask your NBS sales rep for details

INVENTORY RACKING & SHELVES

Exclusively designed and manufactured for NBS freezers to maximize storage space



NBS manufactures a variety of racking systems, boxes and dividers to maximize storage space

- Anodized aluminum racking is lightweight and durable
- Standard racks hold 2", 3" or 4" boxes
- Custom racking solutions also available
- Waterproof boxes and wax-coated cardboard dividers provide a low-cost alternative to injection-molded boxes
- Supplemental stainless-steel shelves also available

WARRANTY & AFTER SALES SUPPORT

All NBS freezers are covered by a FIVE-YEAR Limited Warranty:

Two years covering parts and labor — with THREE ADDITIONAL years covering parts. Additionally, VIP insulation panels are warranted for TWELVE YEARS. Customizable extended warranties and preventive maintenance plans can also be tailored to best suit your individual requirements. Outside of the U.S. and Europe, contact your local NBS sales representative for warranty details.

Every NBS freezer is also equipped with unique S.M.A.R.T. Plus™ diagnostic software to help quickly identify the cause of a fault or setpoint variance. Easily accessed through the front control panel, S.M.A.R.T., Systems Monitoring and Reporting Technology, can be used to identify and correct problems, often over the phone at no charge, with the aid of our trained service technicians. S.M.A.R.T. Plus not only eliminates unnecessary service calls, but provides advance diagnosis, so should an on-site repair become necessary, the service engineer arrives at your facility with the components needed to complete the repair.

Compressor and biodegradable gasses are commercially available, for ready replacement, anywhere in the world.

NBS freezers are backed by one of the largest service organizations, comprised of in-house technicians, field engineers, and factory-authorized service centers in your local area.



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